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An Acoustic Analysis of Vowel Pronunciation in Swedish Dialects

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Chapter 9

Summary and conclusions

The aim of this thesis was to study dialectal variation in Swedish vowel pronunciation. The Swedish dialects have undergone massive leveling during the 20th century. Many features of the traditional rural dialects have been lost, and local dialects have been replaced by regional dialects and regional varieties of Standard Swedish. Vowel pronunciation is considered one of the linguistic levels where considerable regional variation across the Swedish language area is still found.

The data for this study come from the SweDia dialect database. The database includes data recorded at more than one hundred rural sites in Sweden and the Swedish speaking parts of Finland around year 2000. For this thesis data from 98 sites was analyzed. At each site approximately twelve speakers were recorded: three older women, three older men, three younger women and three younger men. The older speakers were approximately 55–75 years old and the younger speakers between 20 and 35.

The vowel data comprises isolated words where the vowels are in a C__C context. Most of the words are monosyllabic, and in the disyllabic words the vowel analyzed is the one in the stressed position, which should assure maximal differentiation between vowel classes. Words with coronal consonants were chosen for eliciting the vowels to minimize different co-articulation effects in different vowels.

Nineteen vowels were analyzed. This set of vowels includes all of the Standard Swedish long vowel phonemes. Of the Standard Swedish short vowels four (/ʊ/, /ø/, /ɛ/ and /ø/) are missing, because they had not been consistently elicited for the SweDia database. In addition to the Standard Swedish phonemes, allophonic variants were included and a few vowels reflecting Proto-Nordic diphthongs. Vowels vary not only sub-phonemically, but also phonemically across Swedish dialects. Since no automatic way of doing a phonemic analysis of a large number of varieties exists, this thesis was restricted to analyzing phonetic variation only. For this reason, the vowels might represent different phonemes categories in the varieties that are being compared. Phonemic variation can be expected especially in areas where dialect leveling has not been very strong and traditional rural dialects have been preserved. Because phonemic variation has not been taken into account in this thesis the vowels

are being referred to by the word that was used for elicitation instead of referring to phoneme categories; for example, the *lat* vowel instead of /ɑ:/.

The vowels were analyzed acoustically by means of principal component analysis of Bark-filtered vowel spectra. The two extracted principal components (PCs) can be interpreted roughly in terms of vowel height (PC1) and advancement (PC2). A correlation with formant measurements of a subset of the data showed high correlations. The correlation between PC2 and F2 is somewhat weaker than between PC1 and F1.

Diphthongization was taken into account by either letting one sample near the onset (at 25% of the duration) and one sample near the offset (at 75%) represent each vowel pronunciation (§§ 6.1 and 6.3), or by using nine continuous sampling points of every segment (§ 6.2 and Chapter 7). Only vowel quality was analyzed, not vowel length. Differences in how phonological quantity of vowels and consonants is realized in Swedish dialects has been studied previously. Schaeffler (2005) made a typology of Swedish dialects based on quantity using data from the same database as the one employed in the present study.

Dialectal variation was studied both in each vowel and on an aggregate level. Both methods contributed to the understanding of the dialectal variation and were shown to complement each other.

The analysis on the variable level showed that the two most variable vowels across sites in the data set were the vowels in *dör* and *sot* while the vowels that showed the least degree of geographic variation were the vowels in *särk*, *lass* and *disk*. Long vowels showed considerably more variation than short vowels. Most of the vowels analyzed were more variable across sites in the older generation of speakers than in the younger generation. Only the vowel in *söt* showed considerably more variation among younger speakers than among older speakers.

A factor analysis showed the co-occurrence of a number of vowel features. The first factor showed that varieties in Svealand and southern parts of Finland share some spectral feature which is connected to PC2 of front vowels. This feature might be connected to voice quality differences rather than to vowel articulation. The second factor identified diphthongization of long vowels in South Swedish varieties, which is most strongly influencing close vowels. The third factor identified that a number of front vowels are being pronounced more open by younger speakers than by older speakers.

An aggregate analysis of the vowel data showed that the Swedish dialects form a linguistic continuum when it comes to vowel pronunciation and no abrupt dialect borders can be found, which is in line with previous literature. Within the continuous distribution of vowel features, however, some more coherent dialect areas could be identified. These areas coincide to a large extent with classifications that have previously been proposed for Swedish dialects (Wessén, 1969) and for regional varieties of Standard Swedish (Elert, 1994). The areas are also similar to those proposed in an intonational typology of Swedish dialects by Bruce (2004), but not so similar to those proposed in the typology of phonological quantity in Swedish dialects by Schaeffler (2005).

The analyses indicated a large-scale leveling of Swedish dialects. The average linguistic distances between sites based on vowel pronunciation were significantly shorter for younger speakers than for older speakers. This effect was seen clearly on maps visualizing the results of multidimensional scaling. But even if the linguistic distances between dialects are becoming smaller, the same larger geographic regions could be identified in the variation in vowel pronunciation of both older and younger speakers.

A large linguistic distance between older and younger speakers was found in the province Norrbotten, where the results of the analysis on the variable level showed that the change can be interpreted as a strong tendency to convergence to Standard Swedish. While older speakers in Norrbotten make use of several diphthongs, both ones that originate from Proto-Nordic and ones that are a result of later developments, most younger speakers use only monophthongs, which corresponds to the Standard Swedish vowel system.

In other peripheral areas that are also characterized by a rich amount of diphthongs, the tendency to convergence to Standard Swedish is not as strong. This is the case for the island Gotland, the south of Sweden and some varieties in Finland.

In central Sweden, around and south of Stockholm and close to Göteborg, the aggregate distance in vowel pronunciation between older and younger speakers is large. The ongoing change in vowel pronunciation in central Sweden could be connected to an ongoing chain shift in front mid-vowels (described in detail in § 8.2.2). In Standard Swedish the vowels /ɛ:/ and /ø:/ have been characterized by allophonic variation with more open variants ([æ:], [œ:]) being used before /r/. In the dialects, this allophony has been found mainly in the east, while western dialects have not had any allophony of these two vowels, but the pronunciation has been close in all contexts. The new pronunciation that many younger speakers in central Sweden have does not correspond to any of the two mentioned systems, but an open pronunciation of the two vowels, corresponding to the one found only before /r/ in Standard Swedish, is used in all contexts. This diffusion of more open variants of /ɛ:/ and /ø:/ in central Sweden has been noted by scholars previously. In this thesis the lowering could be confirmed acoustically for a large central Swedish area. Also for younger speakers representing Standard Swedish in the data set a lowering, which leads to reduced phonetic distinction between the allophonic variants, was detected.

An additional long vowel involved in the chain shift is the vowel in *lus* (Standard Swedish /u:/). The phonetic character of this vowel has complicated structural descriptions of the Standard Swedish vowel system. The vowel in *lus* shows considerable variation in the acoustic measures across the dialects involved in this study. A lowering of /u:/ in combination with the loss of allophonic variants of /ɛ:/ and /ø:/ in Standard Swedish would lead to a smaller vowel inventory and a more symmetric vowel system, and can hence be interpreted as simplification. Simplification often occurs as a result of dialect contact in regional dialect leveling. When it comes to the ongoing change in Swedish front vowels many dialects show convergence to Standard Swedish by adopting the open variants of /ɛ:/ and /ø:/, which have been associated with Standard Swedish pronunciation. But at the same time the system

without allophonic variation, which has been characterizing for many dialects but not for Standard Swedish, is maintained. These results suggest that the interaction between dialects and Standard Swedish has led to a development where the Standard Swedish vowel system becomes more simplified in the course of time.